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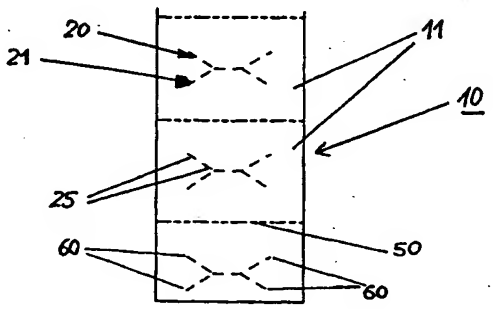
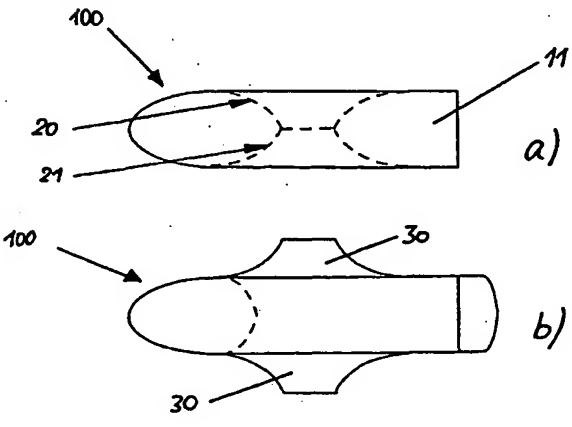
(54) Title: PACKAGING MATERIAL SHEET WITH AT LEAST ONE LINE OF WEAKNESS, AND PACKAGING MATERIAL





(57) Abstract: A packaging material sheet having at least one line of weakness to open a pack produce from the packaging material for a product, in particular a substantially cylindrical mass product, whrein the packaging material sheet can be peeled off the packed product after the at least partial destruction of the least one line of weakness is suggested. It is further suggested a packaging material which comprises a material web of such packaging material sheets which are joined together and which are designed such that they can be separated from the material web in order to pack a product, in particular a substantially cylindrical mass product.

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Packaging material sheet with at least one line of weakness, and packaging material

The invention relates to a packaging material sheet which has at least one line of weakness in order to open a pack produced from the packaging material for a product, in particular a mass product, and to a corresponding packaging material.

Such a packaging material is disclosed by EP 0 597 446 A1. The line of weakness described is a line which runs through the packaging material and is composed of a row of weak points of different size and type, so that the material comprises two parts connected by the line of weakness. The line of weakness can also be composed of a row of weak points which have a particular geometry, for example arrows or semicircles.

The packaging material disclosed in EP 0 597 446 A1 is mainly used to pack tampons. In order to open the tampon pack or other packs, the two parts of the packaging material separated from each other by the line of weakness are rotated in relation to each other or at least displaced in the opposite directions, so that the line of weakness is destroyed and two pack parts completely separated from each other remain. These pack parts enclose the product substantially completely, even after the destruction of the line of weakness, and are pulled off from the packed product in opposite directions in a further step.

In particular in the case of products such as tampons for feminine hygiene, which are enclosed very closely by the packaging material for space-saving reasons and to avoid material damage, the problem arises that the individual pack parts are difficult to pull off the product or can no longer be pulled off the product, particularly if the product expands. This may be the case primarily in the aforementioned tampon for feminine hygiene, but also in the case of other products made of compressed materials, since these can continue to expand after manufacture and after packaging.

It is accordingly an object of the present invention to provide an improved packaging material, in particular for tampons for feminine hygiene, which permits the product to be unpacked simply, above all tightly packed products which can still expand after being packed.

This object is achieved, according to a first aspect, by a packaging material sheet as claimed in claim 1 and a packaging material as claimed in claim 16. Claims 2 to 15 and 17 identify particularly advantageous embodiments according to the first aspect of the packaging material sheet according to the invention and the packaging material according to the invention.

Furthermore, this object is achieved, according to a second aspect of the invention, by a packaging material sheet as claimed in claim 18 and a packaging material as claimed in claim 29. Claims 19 to 28 and 30 identify particularly advantageous embodiments of the packaging material sheet according to the invention and the packaging material according to the invention in accordance with the second aspect of the invention.

According to the first aspect of the invention, after the destruction of the at least one line of weakness, the packaging material sheet with at least one line of

weakness can be peeled off the product. "Can be peeled off" is to be understood here to mean that the user can grip the packaging material in at least one sub-area after the at least partial destruction of the line of weakness and can pull off or remove the packaging material sheet completely from the product. The packaging material sheet according to the invention ensures that the three-dimensional structure of the packaging material sheet is completely or gradually broken down with the destruction of the line of weakness. The packaging material sheet can be peeled off the product without any stresses which may occur as a result of expansion of the product counteracting the unpacking of the product, as is the case in the prior art described above.

The packaging material sheet can preferably be peeled off the product in one piece. This has the advantage that the user or customer, after opening the product, only holds and must dispose of one packaging part. This is significant in particular in the case of cellophane sleeves, which are normally used for packing tampons for feminine hygiene, since a plurality of individual cellophane parts are difficult to handle, because of their frequent electrostatic charge. However, the problem also applies to other packaging materials.

In a preferred embodiment of the packaging material sheet, the at least one line of weakness has at least one end point, preferably at least two end points arranged at a distance from each other, within the packaging material sheet. This ensures in particular that the packaging material sheet can be peeled off in one piece. Furthermore, controlled peeling of the packaging material sheet is possible. In a special embodiment, the end points can also be reinforced, in order to prevent the packaging material sheet tearing beyond the end points.

The at least one line of weakness can advantageously be destroyed by means of compression and/or bending or by means of the at least partially opposed action of force on the packaging material sheet. For the user, this permits the rapid and simple destruction of the line of weakness and the opening of the product. Additional tear-off strips or overlapping parts of the packaging material sheet are not needed. The stability of the line of weakness is in this case matched to the product to be packed, primarily to its flexibility, in order that the user does not have to expend any great force to destroy the line of weakness, on the one hand, but on the other hand inadvertent destruction of the line of weakness is avoided.

In this connection, it should be noted that, as opposed to the packaging material described in EP 0 597 446 A1, slight expansion of the product, in the case of the packaging material sheet according to the invention, can even facilitate unpacking. If the line of weakness is destroyed, and if the product was prestressed by subsequent expansion against the packaging material sheet, then the packaging material sheet will generally lift off the product easily at a point, so that it can be gripped without difficulty by the user and, as described above, can be peeled off.

The at least one line of weakness is preferably curved and/or it runs at least partially in at least two directions differing from each other. As a result, following the destruction of the line of weakness, the product can be unpacked more easily or the packaging material sheet can be peeled off more easily, since any prestresses which may be present are already relieved in a plurality of directions. Furthermore, such a line of weakness or the interaction of a number of lines of weakness lead to one end of the pack being available to be gripped by the user in order to peel off the

packaging material sheet, after the at least partial destruction of the at least one line of weakness.

The at least one line of weakness preferably has a U-shaped or a sinusoidal course. According to a further embodiment, two lines of weakness arranged at a distance from each other are provided with a curved course or there are two mutually crossing lines of weakness, the mutually crossing lines of weakness preferably running substantially in straight lines. By choosing the course of the line of weakness, the unpacking or unpeeling actions can be made substantially easier, depending on the product to be packed. It has transpired that, in particular when packing cylindrical products, such as tampons for feminine hygiene, rapid and simple removal of the product from the pack can be ensured by a course of the at least one line of weakness as described above.

The at least one line of weakness preferably comprises weak points arranged at a distance from one another. The weak points can have different and/or varying dimensions. As a result, if the weakening of the line of weakness is adequate for unpacking the product, the overall stability of the packaging material sheet is not reduced, so that inadvertent damage or destruction of the packaging material sheet or its inadvertent opening is avoided.

The lines of weakness or the weak points can be formed by means of perforation and/or a reduced material thickness in the area of the line of weakness. Forming the line of weakness only by means of a reduced material thickness of the packaging material sheet has the advantage that the packed product is protected against dampness and contamination from the outside without further measures.

The invention further relates to a packaging material which comprises a web of packaging material sheets, as described above, adjoining one another. The individual packaging material sheets are designed such that they can be separated from the web in order to pack a product. For mass production, in particular, such packaging material sheets cohering in a web have the advantage that they can be supplied quickly and without difficulty to the corresponding packaging device. The packaging material web is normally wound up on itself, so that a roll of the packaging material sheets lined up in a row is made available.

In addition, the web preferably has a line of weakness between the individual packaging material sheets, for example a reduced material thickness and/or a perforation. As a result, the individual material sheets for packaging are simple to separate from the web and to process. According to a second aspect of the invention, the packaging material sheet is provided with at least one line of destruction for opening a pack produced from the packaging material for a product, the at least one line of destruction extending over at least part of the longitudinal extent of the pack after the product has been packed. This achieves the situation where the parts of the pack which are produced following the destruction of the line of destruction and which are substantially sleeve-like, do not extend completely around the circumference of the product to be packed, at least over part of their longitudinal extent. Since, in this way, the friction between the sleeve-like parts of the pack which are produced and the product to be packed is reduced, the sleeve-like parts can be pulled off the packed product more easily, substantially in the longitudinal direction of said product.

In one embodiment, the line of destruction, following the packing of the product, extends over 20% of the

longitudinal extent of the product, preferably over 50% of the length of the packed product and particularly preferably over 70% of the length of the packed product.

The line of destruction may be a line of weakness as has already been described in connection with the first aspect of the present invention. In addition, the line of destruction can also be implemented by providing a tearing thread which, when pulled, destroys the line of destruction.

The line of destruction is preferably curved or sinusoidal, it being possible for it to be formed around the circumference of the packed product with one curve or a plurality of curves.

According to the second aspect, the invention also relates to a packaging material which, according to the second aspect of the invention, comprises a material web of cohering packaging material sheets, which can be separated from the material web in order to pack a product. This packaging material preferably has a line of weakness, in particular a reduced material thickness and/or a perforation, between the packaging material sheets.

The invention will be described in detail below using the appended schematic drawings of a number of exemplary embodiments, in which:

Fig. 1 shows a web with packaging material sheets according to a first embodiment of the first aspect of the invention;

Figs 2a and 2b show a tampon which has been packed with a packaging material sheet according to Fig. 1, and also individual unpacking steps;

Fig. 3 shows a web with packaging material sheets according to a second embodiment of the first aspect of the invention;

Figs 4a, 4b, 4c and 4d show a tampon which has been packed with the packaging material sheet shown in Fig. 3, and also individual unpacking steps;

Fig. 5 shows a web with packaging material sheets according to a third embodiment of the first aspect of the invention;

Figs 6a, 6b, 6c and 6d show a tampon which has been packed with the packaging material sheet shown in Fig. 5, and also individual unpacking steps;

Figs 7a and 7b show two tampons packed with a fourth embodiment of the packaging material sheet according to the first aspect, in two different variants;

Fig. 8 shows a tampon packed with a fifth embodiment of the packaging material sheet according to the first aspect of the invention;

Figs 9a, 9b show a first embodiment of a packaging material sheet according to the second aspect of the invention, and also a tampon which has been packed with such a packaging material sheet; and

Figs 10a, 10b show a second embodiment of a packaging material sheet according to the second aspect of the invention, and also a tampon which has been packed with such a packaging material sheet.

Fig. 1 shows a cellophane web 10 from which individual sheets 11 connected to one another via a line of weakness 50 can be separated and are used as packaging material sheets 11 for a product, for example a tampon. The packaging sheet 10 is essentially rectangular and,

in its central area, is provided with two mutually crossing lines of weakness 20, 21, which run together at the center to form a single line of weakness.

The lines of weakness 20, 21 consist of individual weakening sections or weak points 25, in which the packaging material has a reduced thickness, and end in a total of four end points 60.

Fig. 2a shows a tampon 100 for feminine hygiene packed in the packaging material sheet 11 shown in Fig. 1. The lines of weakness 20, 21 are arranged in a side area of the substantially cylindrical tampon 100. The tampon 100 is completely enclosed by the packaging material sheet 11 and is welded at the folding or winding points at its ends, so that the tampon 100 is protected against dampness and contamination from the outside.

As can be seen from Fig. 2b, after the destruction of the lines of weakness 20, 21, two sub-areas 30 of the packaging material sheet 11 can be peeled off the tampon 100 in opposite directions. Even if the tampon has expanded after being packed, the packaging material sheet 11 can be peeled off the tampon 100 without difficulty.

Figs 3 and 4 show a second embodiment of a packaging material sheet 11 according to the invention in a similar illustration. Corresponding elements are provided with identical reference symbols.

The line of weakness 23 in this embodiment is of U-shaped design and has two end points 60. Furthermore, orientation points 40 are arranged visibly on the packaging material sheet 11, inside and outside the U. The orientation points 40 are printed on and are used firstly for the positioning and the optical monitoring of the production machines during the production of the packaging material, in particular during the

introduction, preferably performed with a laser, of the line of weakness 23, and secondly they are used by the user as an indication as to where pressure has to be exerted on the packed product in order to destroy the line of weakness, as shown in Fig. 4 and explained below.

Fig. 4 shows in schematic form how a tampon 100 for feminine hygiene packed with the packaging material sheet 11 shown in Fig. 3 is removed. As can be seen in Fig. 4a, the user takes the packed tampon in both hands and bends it downward in the outer areas in relation to the central area, in the direction of the arrows shown in Fig. 4b. The flexible tampon gives way, and the line of weakness is destroyed, so that a lateral area 31, lying at the top in Fig. 4b, folds open upward. As Figs 4c and 4d show, this area 31, corresponding to the inner area of the "U", can be gripped by the user and led around the tampon, so that the entire packaging material sheet 11 is peeled off the tampon 100 in one piece.

A third embodiment is depicted in Figs 5 and 6 in a way similar to the preceding figures. Here, too, corresponding elements are identified by identical reference symbols.

Fig. 5 again shows a packaging material sheet 10, from which a packaging material sheet 11 according to the invention can be separated. The packaging material sheet 11 has two slightly curved lines of weakness 24, 26. The packaging material sheet 11 is substantially rectangular but, in a side area, has a curve 27 which has the shape of a circular segment and extends over the otherwise rectangular cross section, and also a cutout corresponding to the curve 27 in its opposite side area.

In addition, at two end points 60 of the lines of weakness 24, 26, the packaging material sheet 11 in each case has a reinforcing area 29, formed as a line in this embodiment, which prevents the packaging material sheet 11 tearing beyond the lines of weakness 24, 26 when the product is being unpacked, and in this way ensures peeling off in one piece.

As opposed to the embodiments shown in Figs 1 to 4, the lines of weakness 24, 26 are not composed of individual weak points but consist of a continuous line of weakness, over whose entire extent the thickness of the material is reduced.

Fig. 6 shows schematically, in a similar way to Figs 2 and 4, the unpacking of a tampon 100 which has been packed with the packaging material sheet 11 illustrated in Fig. 5.

As shown in Figs 6a and 6b an area 32 of the packaging material sheet 11 located under the circular-segment like curve 27 in the figures is firstly pulled downward (in the figure) and then, as illustrated in Figs 6c and 6d, led around firstly in the direction of its recovery end and then around the tampon, in a similar way to the packaging material sheet 11 shown in Figs 3 and 4, so that the packaging material sheet 11 is peeled off the tampon 100 gradually and in one piece.

Fig. 7 shows a tampon 100 which has been packed with two versions of a fourth embodiment of the packaging material sheet 11 according to the invention. The packaging material sheet has a substantially sinusoidal line of weakness 28, 28′. In the embodiment shown in Fig. 7a, the sinusoidal line of weakness 28 extends substantially around the entire circumference of the tampon 100, while the line of weakness 28′ shown in Fig. 7b extends only on one side of the tampon 100,

that is to say in an angular range of 180° around the circumference of the tampon 100.

The lines of weakness 28, 28' are formed by lining up individual weak points (not illustrated) in a manner similar to that in the embodiments shown in Figs 1 to 4. The weak points are points with reduced material thickness. Instead of the reduced thickness, however, a perforation along the lines of weakness 28, 28' is also possible.

Fig. 8 shows a tampon 100 which has been packed with a fifth embodiment of the packaging material sheet 11 according to the invention and is very similar to the version shown in Fig. 7b.

This packaging material sheet also has a substantially sinusoidal line of weakness 28', but it extends only in a rear area of the tampon 100, in the vicinity of the recovery end of the tampon 100, over about 20% of the length of the tampon 100 in this embodiment. As in the version of the fourth embodiment shown in Fig. 7b, the line of weakness extends around the circumference of the tampon 100 only over an angular range of 180°, but it is also possible to provide an embodiment corresponding to the version shown in Fig. 7a, whose line of weakness extends substantially around the entire circumference of the tampon.

All the packaging sheets shown in the exemplary embodiments described above have lines of weakness with at least two end points 60 lying within the packaging sheets 11. In addition, in all the embodiments shown, the packaging material consists of a cellophane film with a thickness of about 22 µm. The weakening sections or weak points 25 and the continuous lines of weakness 24, 26 have a thickness of about 7 to 10µm. The weak points and the lines of weakness are introduced into the cellophane film by means of a laser while

maintaining a constant transport speed of said cellophane film. Instead of the cellophane film, however, a polyethylene film or another plastic film can also be used.

Fig. 9a shows a packaging material sheet 11 of a first embodiment according to the second aspect of the invention. The packaging material sheet 11 likewise consists of cellophane and has a continuous line of destruction 70, the line of destruction 70 being substantially sinusoidal and, over the width of the packaging material sheet 11, substantially representing one complete sinusoidal oscillation.

In this embodiment, the line of destruction 70 is a line of weakness formed by lining up individual weak points (not illustrated).

The weak points are points with a reduced material thickness. Instead of the reduced thickness, however, a perforation along the line of destruction 70 would also be possible in this embodiment.

Fig. 9b shows a tampon 100 which has been packed with the embodiment of the packaging material sheet 11 shown in Fig. 9a.

The line of destruction 70 extends approximately over 50% of the length of the tampon 100, so that after the destruction of the line of destruction 70, which can be brought about, for example, by rotating the packaging material sheet along the arrows A shown in Figs 9a and 9b, the two sleeve-like parts 12, 13 of the packaging material sheet 11 which are produced can be pulled off the tampon 100 in the longitudinal direction of the tampon and, in relative terms, in opposite directions.

Since the sleeve-like parts 12, 13 of the packaging material sheet do not enclose the tampon over an

angular range of 360° over a large part of their longitudinal extent, but are open at one side over a large part of the longitudinal extent, the frictional forces as the parts 12, 13 are pulled off are reduced, which permits them to be pulled off considerably more easily, even in the case of a tampon 100 which has expanded slightly following production.

Figs 10a and 10b show a second embodiment according to the second aspect of the invention, which is very similar to the embodiment shown in Fig. 9. As opposed to the line of destruction 70 of the embodiment shown in Fig. 9, the line of destruction 70 in this embodiment is wavy and extends only over a range of about 20% of the longitudinal extent of the tampon 100. The effects and mode of action of the packaging material sheet according to the invention correspond to the embodiment in Fig. 9.

Of course, it is also possible to implement different geometric embodiments. In particular, it is also possible to provide a line of destruction which is composed of a plurality of rectilinear sections, so that the line of destruction 70 has corners or bends at the points of contact between the rectilinear segments.

The features presented in the claims, the description and the drawings may be essential to the invention both individually and in any combination.

List of reference numerals

10	Packaging material web
11	Packaging material sheet
12	Part (packaging material sheet 11)
13	Part (packaging material sheet 11)
20	Line of weakness
21	Line of weakness
23	Line of weakness (U-shaped)
24	Line of weakness (curved)
25	Weak points
26	Line of weakness (curved)
27	Curve (circular-segment shaped)
28	Line of weakness (sinusoidal)
28′	Line of weakness (sinusoidal)
29	Reinforcing area
30	Sub-area (packaging material sheet 11)
31	Area
32	Area
40	Orientation points
50	Line of weakness between packaging material sheets 11
60	End point (line of weakness)
70	Line of destruction
100	Tampon

Claims

1. A packaging material sheet having at least one line of weakness to open a pack produced from the packaging material for a product, in particular a substantially cylindrical mass product, wherein the packaging material sheet can be peeled off the packed product (100) after the at least partial destruction of the at least one line of weakness (20, 21, 23, 24, 26, 28, 28').

2. The packaging material sheet as claimed in claim 1, wherein it can be peeled off the product in one piece.

3. The packaging material sheet as claimed in claim 1 or 2, wherein the at least one line of weakness (20, 21, 23, 24, 26, 28, 28') has at least one end point (60) within the packaging material sheet.

4. The packaging material sheet as claimed in claim 1 or 2, wherein the at least one line of weakness (20, 21, 23, 24, 26, 28, 28') has at least two end points (60) within the packaging material sheet.

5. The packaging material sheet as claimed in one of claims 1 to 4, wherein the at least one line of weakness (20, 21, 23, 24, 26, 28, 28') can be destroyed by compressing and/or bending the packed product (100).

6. The packaging material sheet as claimed in one of claims 1 to 4, wherein the at least one line of weakness (20, 21, 23, 24, 26, 28, 28') can be destroyed by the at least partially opposite action of force on the packaging material sheet (11).

7. The packaging material sheet as claimed in one of the preceding claims, wherein the at least one line of weakness (20, 21, 23, 24, 26, 28, 28') is curved and/or runs at least partially in at least two mutually different directions.

8. The packaging material sheet as claimed in one of the preceding claims, wherein a line of weakness (23) runs in a U-shape.

9. The packaging material sheet as claimed in one of claims 1 to 7, wherein a line of weakness (28, 28') has a sinusoidal course.

10. The packaging material sheet as claimed in one of claims 1 to 7, wherein two lines of weakness (24, 26) arranged at a distance from each other run in curves.

11. The packaging material sheet as claimed in one of claims 1 to 7, wherein there are two mutually crossing lines of weakness (20, 21).

12. The packaging material sheet as claimed in claim 11, wherein the two lines of weakness (20, 21) run substantially rectilinearly.

13. The packaging material sheet as claimed in one of the preceding claims, wherein the at least one line of weakness (20, 21, 23, 24, 26, 28') is formed from weakening sections or weak points (25) arranged at a distance from one another.

14. The packaging material sheet as claimed in one of the preceding claims, wherein the at least one line of weakness (20, 21, 23, 24, 26, 28, 28') and/or the weakening sections or weak points (25) have different and/or varying dimensions.

15. The packaging material sheet as claimed in one of the preceding claims, wherein the at least one line of weakness (20, 21, 23, 24, 26, 28, 28') is formed by a reduced material thickness of the packaging material sheet (11) and/or by perforating the packaging material sheet.

16. The packaging material which comprises a material web (10) of packaging material sheets (11) as claimed in one of the preceding claims which are joined together and which are designed such that they can be separated from the material web (10) in order to pack a product.

17. The packaging material as claimed in claim 16, wherein the material web (10) has a line of weakness (50), in particular a reduced material thickness and/or a perforation, between the packaging material sheets (11).

18. A packaging material sheet having at least one line of destruction to open a pack produced from a packaging material for a product, in particular a substantially cylindrical mass product, wherein at least one line of destruction (70) extends over at least part of the longitudinal extent of the pack after the product has been packed.

19. The packaging material sheet as claimed in claim 18, wherein the line of destruction (70) extends over at least 20% of the longitudinal extent of the pack.

20. The packaging material sheet as claimed in claim 19, wherein the line of destruction (70) extends over at least 50% of the longitudinal extent of the pack.

21. The packaging material sheet as claimed in claim 19, wherein the line of destruction (70) extends over at least 70% of the longitudinal extent of the pack.

22. The packaging material sheet as claimed in one of claims 18 to 21, wherein the at least one line of destruction (70) is designed as a line of weakness.

23. The packaging material sheet as claimed in claim 22, wherein the line of weakness can be destroyed by compressing and/or bending the packed product (100).

24. The packaging material sheet as claimed in claim 22, wherein the line of weakness can be destroyed by at least partially opposite action of force on the packaging material sheet 11.

25. The packaging material sheet as claimed in one of claims 18 to 21, wherein the at least one line of destruction (70) has a tearing thread for destroying the line of destruction.

26. The packaging material sheet as claimed in one of claims 18 to 25, wherein the at least one line of destruction (70) is curved.

27. The packaging material sheet as claimed in claim 26, wherein the at least one line of destruction (70) substantially has a complete sinusoidal curve over the circumference of the packed product (100).

28. The packaging material sheet as claimed in claim 26, wherein the at least one line of destruction (70) has a plurality of curves over the circumference of the packed product (100).

29. The packaging material, comprising a material web of packaging material sheets (11) as claimed in one of claims 18 to 28 which are joined together and which are designed such that they can be separated from the material web in order to pack a product.

30. The packaging material as claimed in claim 29, wherein the material web has a line of weakness, in particular a reduced material thickness and/or a perforation, between the packaging material sheets (11).

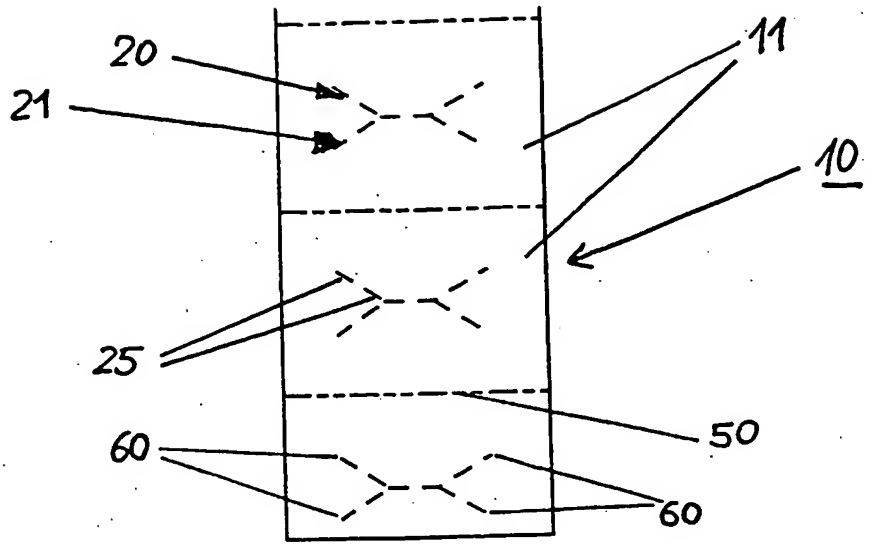


Fig. 1

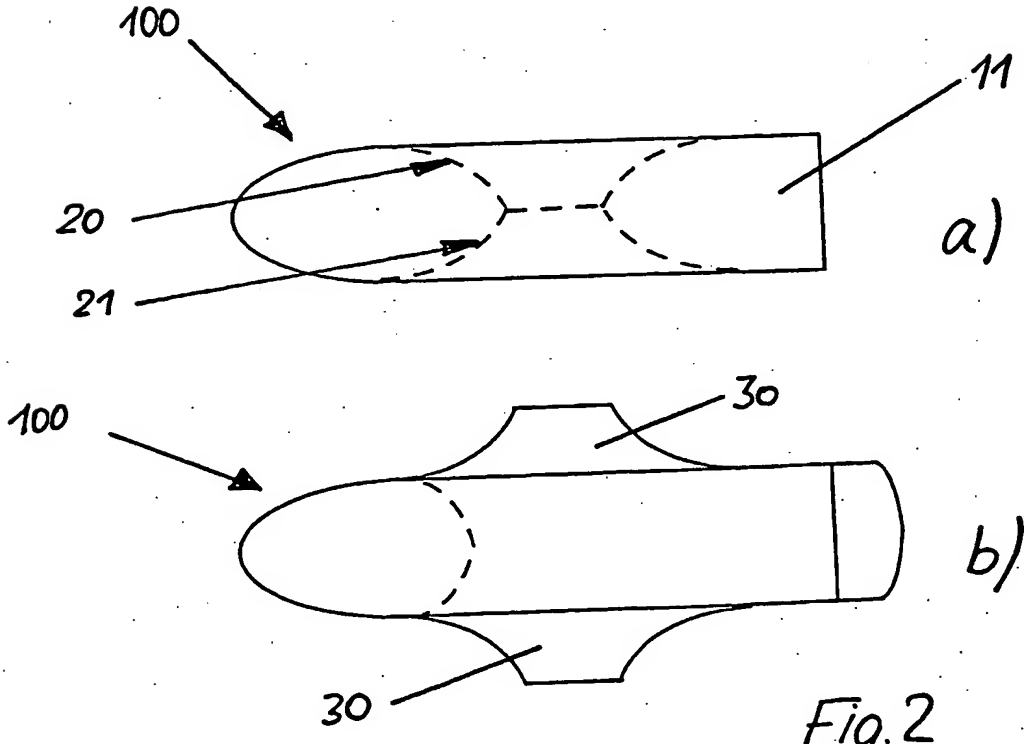


Fig. 2

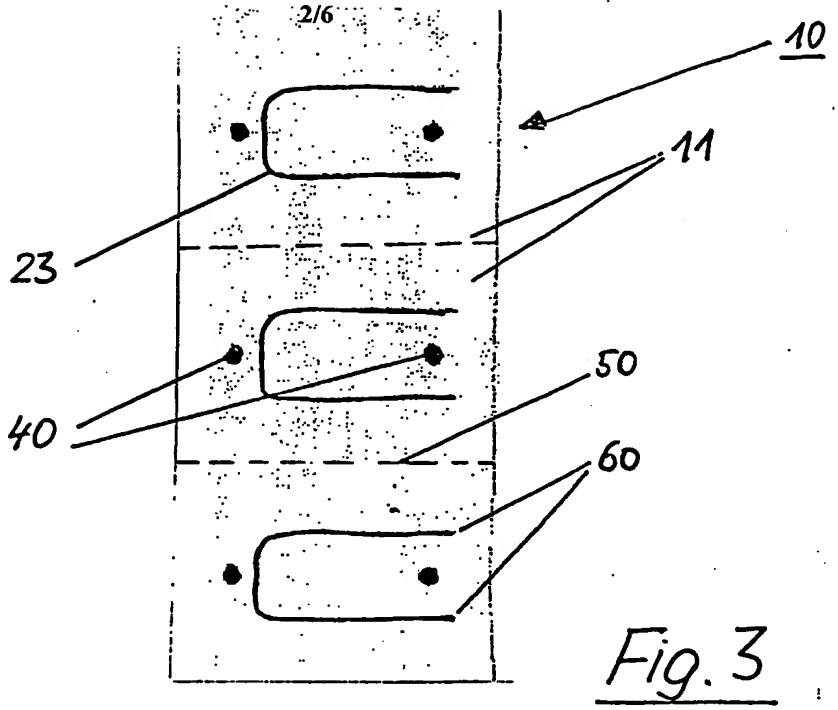


Fig. 3

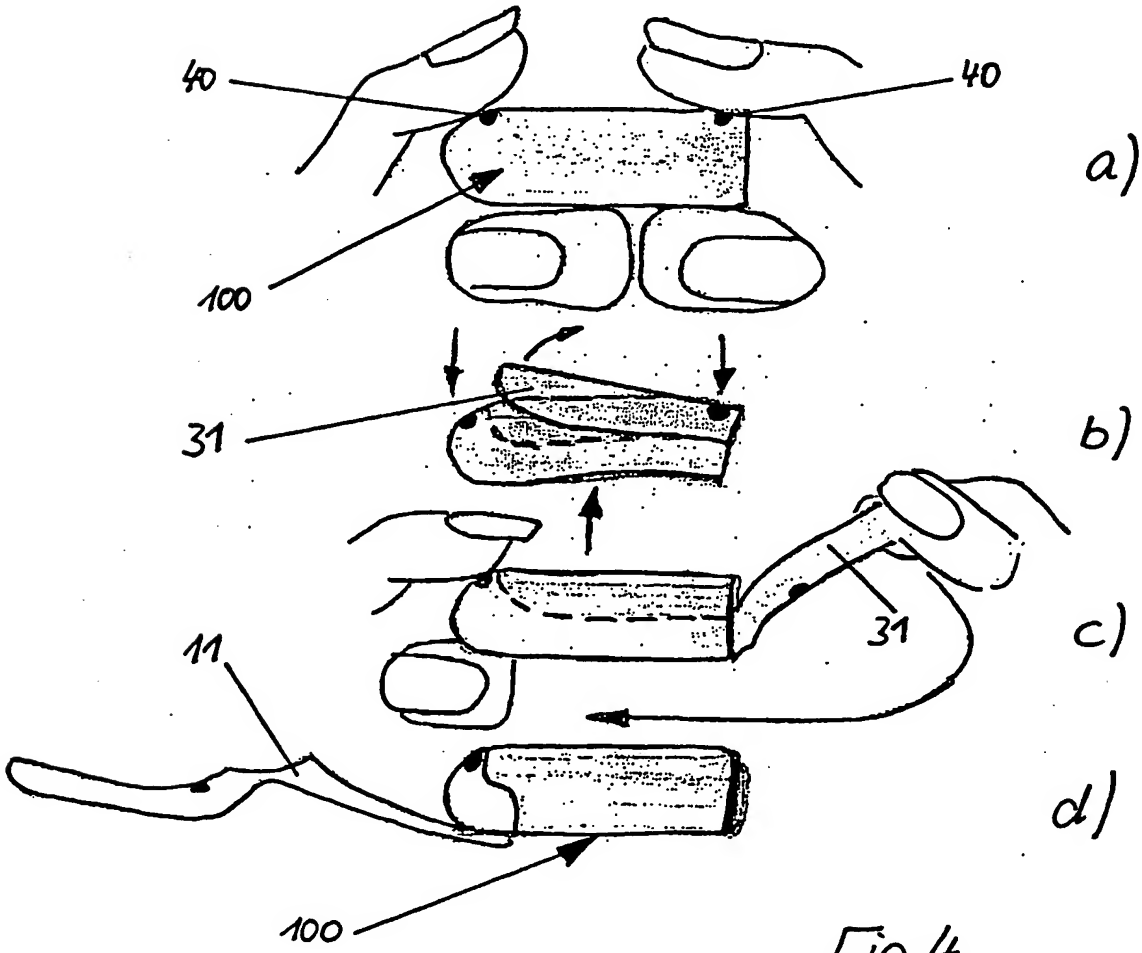


Fig. 4

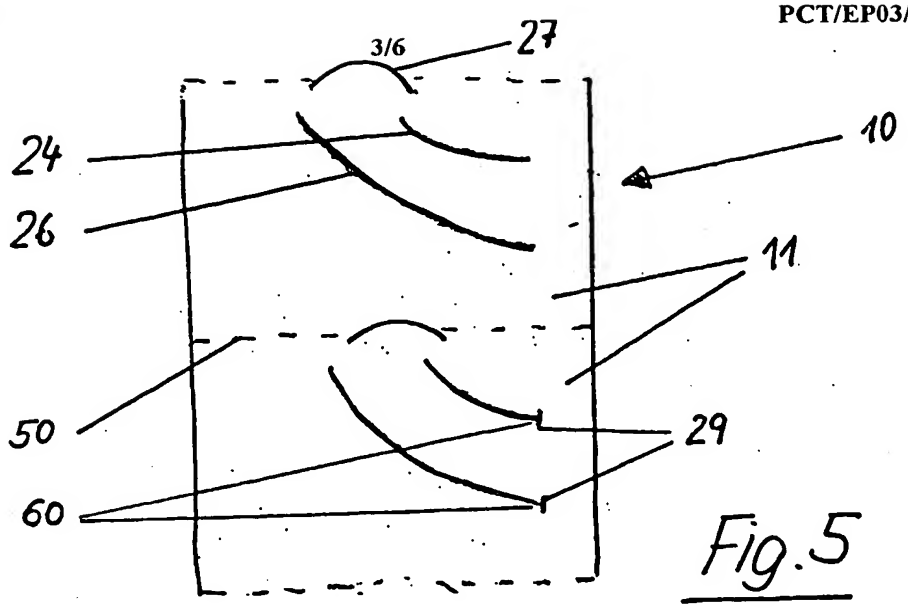


Fig.5

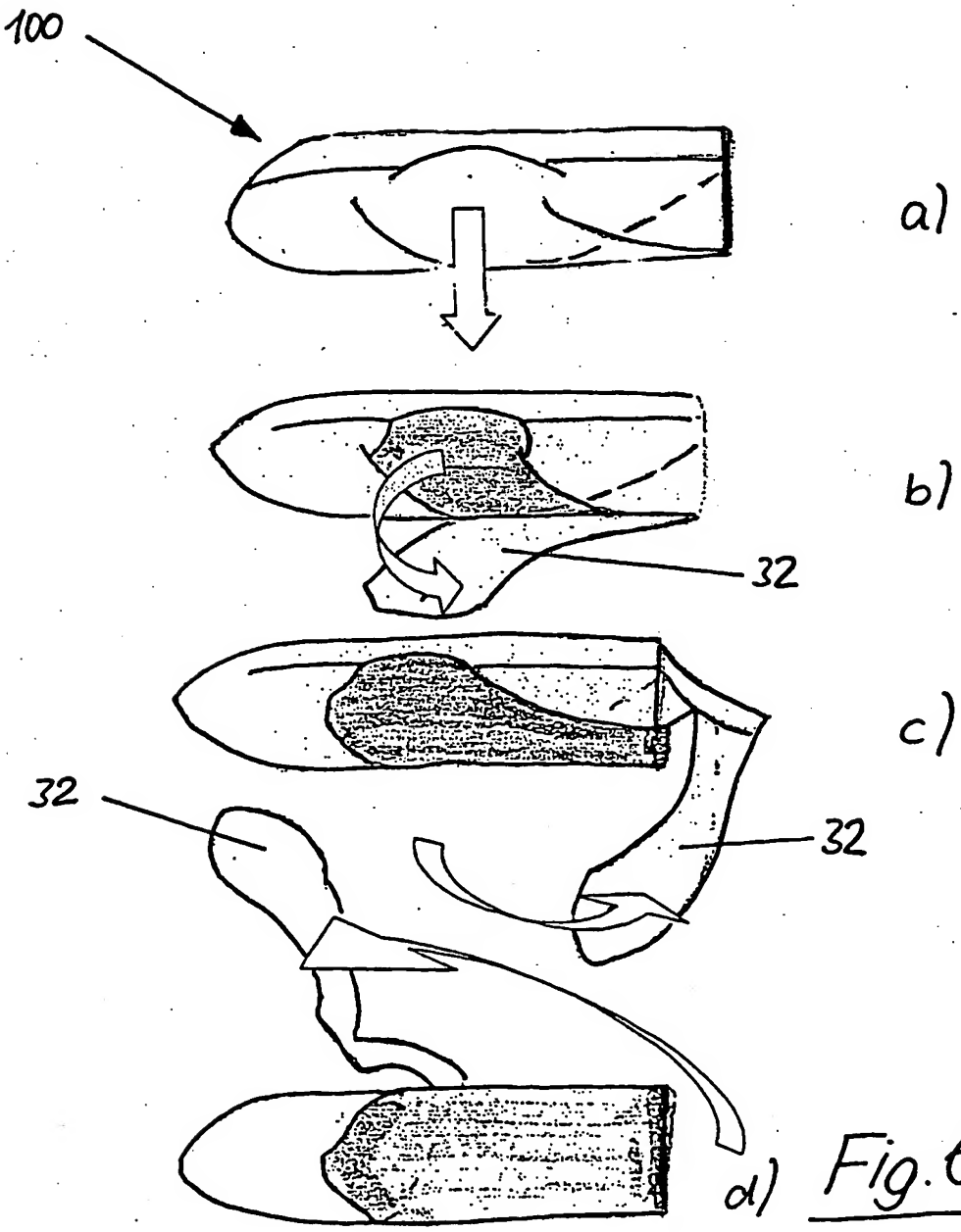


Fig.6

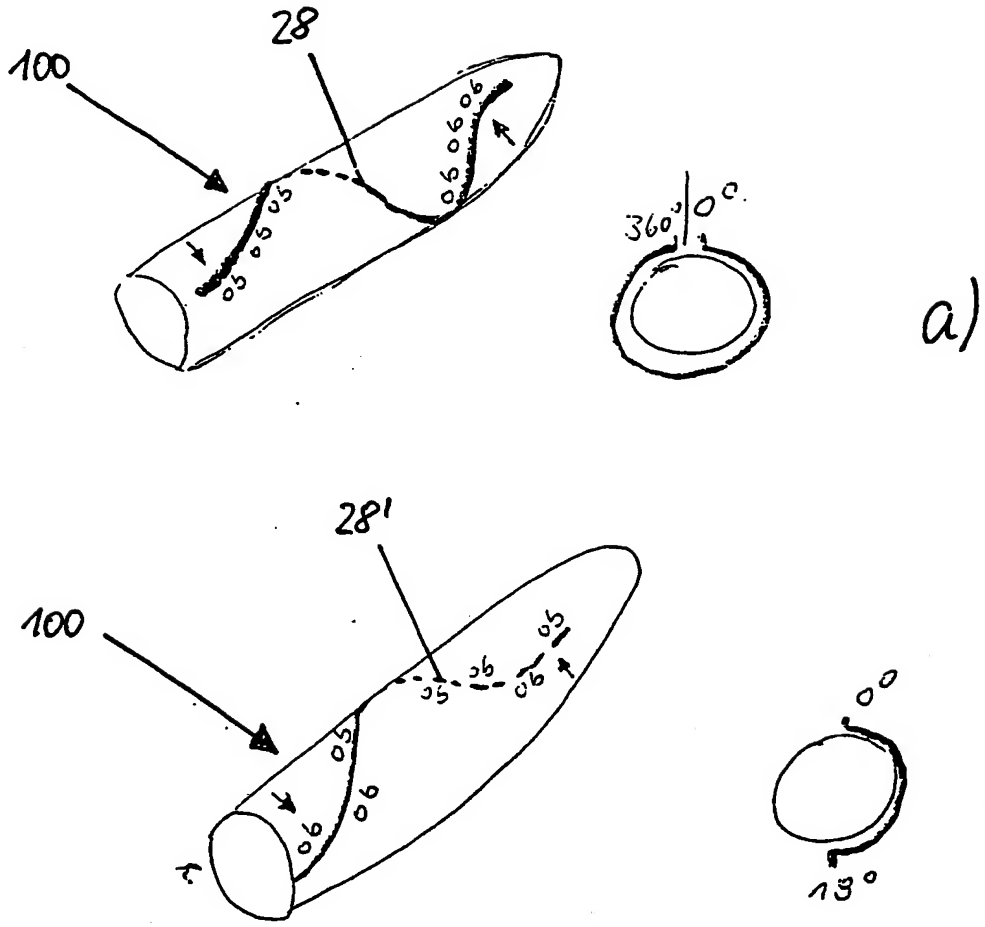


Fig. 7

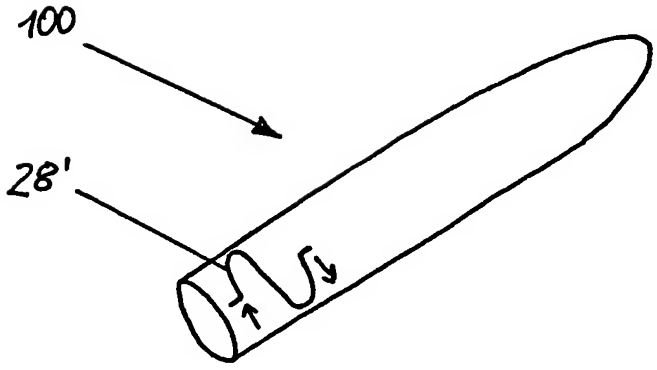


Fig. 8

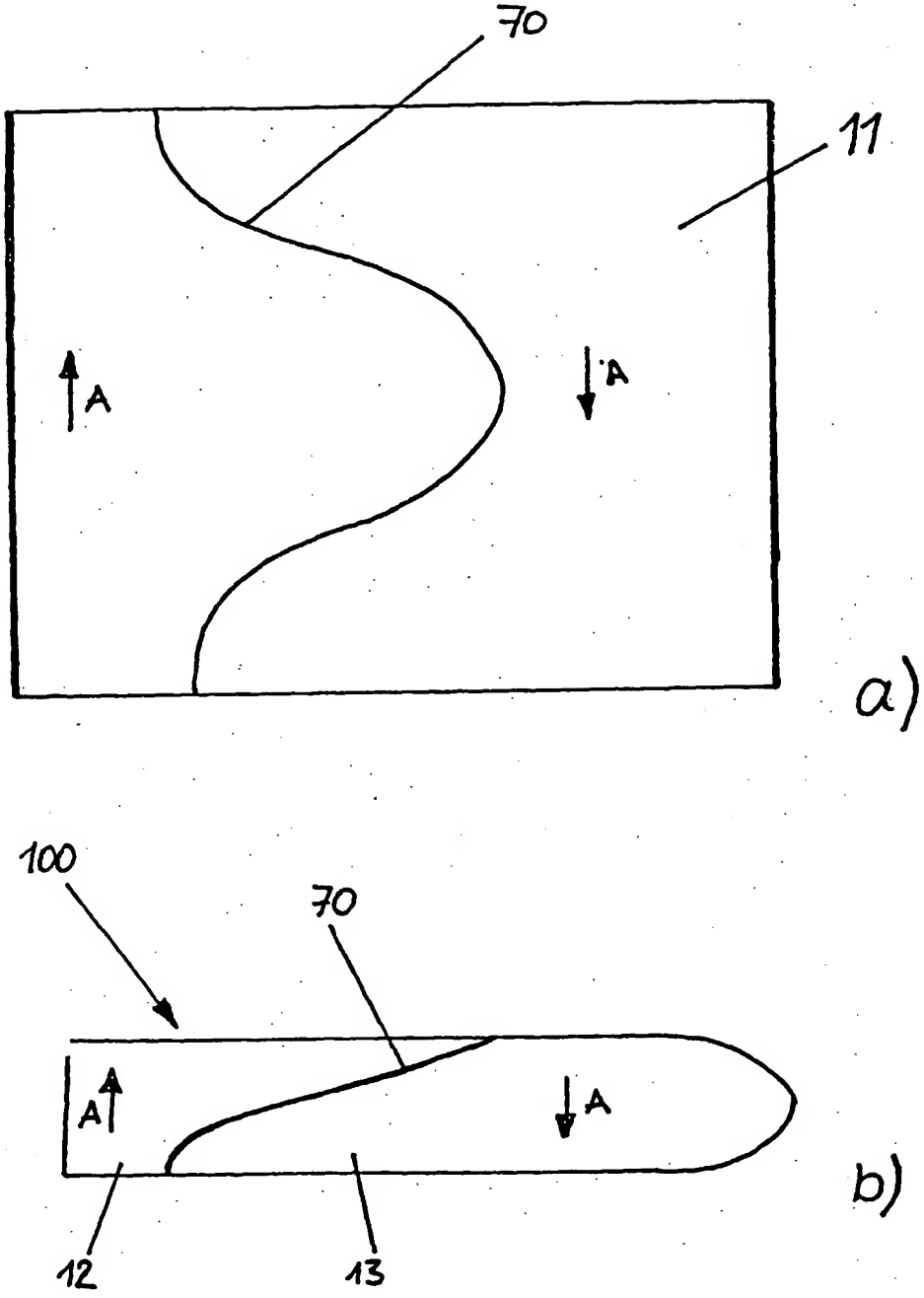
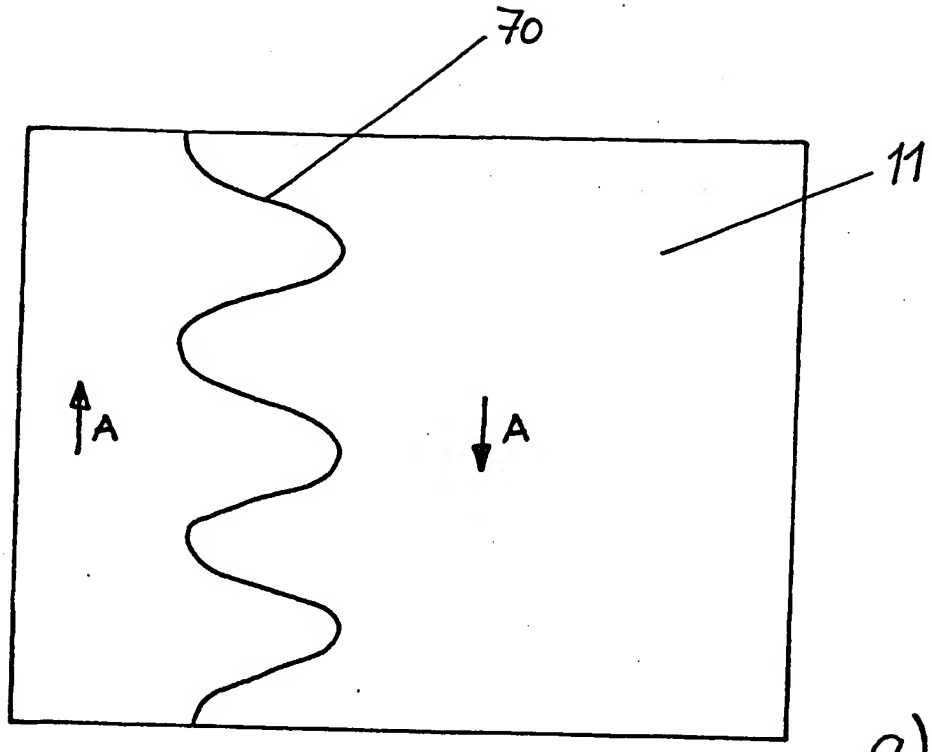


Fig. 9



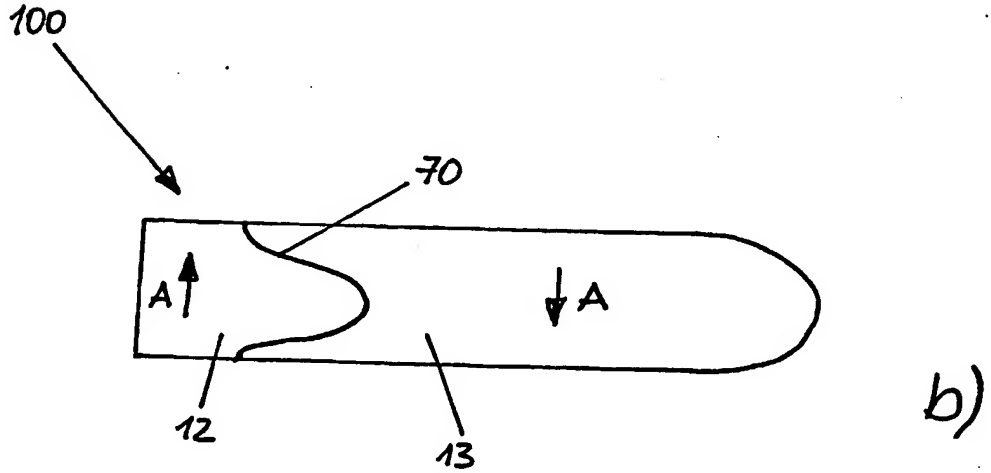


Fig. 10

INTERNATIONAL SEARCH REPORT

Inter — pplication No
PCT/EP 03/03396

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61F15/00 A61F13/15

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 597 446 A (MCNEIL PPC INC) 18 May 1994 (1994-05-18) cited in the application claims 1,2; figures 12,15 column 1, line 1 - line 22 column 2, line 28 - line 29 column 3, line 33 - line 35 --- -/--	1,3-6, 13-15

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 July 2003	08/08/2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Settele, U

INTERNATIONAL SEARCH REPORT

Intern application No
PCT/EP 03/03396

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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